Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended): Power conversion apparatus comprising:

a source-side inverter including on/off switches;

a drive-side inverter including on/off switches;

a dc current link coupled between an output of the source-side inverter and an input of the drive-side inverter; ~~and~~

a controller for operating the source-side inverter in current mode and the drive-side inverter in a commutation mode to achieve sinusoidal input currents at an input of the source-side inverter and sinusoidal output currents at an output of the driver-side inverter; and

rotor position sensors for generating a position signal indicating position of a motor emf Park vector,

wherein the controller generates a rotor position unit vector from the position signal, computes a motor current Park vector that is synchronous with respect to the emf Park vector, PI-regulates an imaginary portion of the synchronous motor current Park vector, uses the regulated imaginary portion to shift the position signal into a shifted signal, and uses the shifted signal to select switches of the drive-side inverter.

2. (currently amended): Power conversion apparatus comprising:

a source-side inverter terminated in an ac capacitor bank;

a drive-side inverter;

a dc current link coupled between an output of the source-side inverter and an input of the drive-side inverter; and

a controller for operating the source-side inverter in current mode and the drive-side inverter in a commutation mode, the controller commanding the source-side inverter to perform current regulation on the dc current link during a first portion of each modulating cycle and current mode space vector modulation during a second portion of each modulating cycle,

wherein during each second portion the controller modulates switches of the source-side inverter to extract fundamental frequency sinusoidal currents from an ac power source,

wherein the current mode space vector modulation produces a current vector,

wherein the controller uses phase angle of the current Park vector to command the source-side inverter switches to connect selected phases of the capacitor bank to the dc current link and maintain a relatively ripple-free current on the dc link, and

wherein the controller also performs damping during each second portion of the modulating cycle through modification of the phase angle by computing a Park vector of capacitor bank voltage, computing a secondPark vector representing resonant frequencies of the voltage Park vector, regulating the second Park vector, and using the regulated second Park vector to correct the phase angle.

3. (original): The apparatus of claim 2, wherein the controller varies duty cycle of each first portion to control average current in the dc link.

4. (original): The apparatus of claim 2, wherein the controller operates the source-side inverter as a buck-chopper during each first portion to perform the current regulation.

5-8. (canceled)

9. (original): The apparatus of claim 1, wherein the controller performs power factor control of the drive-side inverter such that motor current is in phase with motor back emf.

10. (original): The apparatus of claim 1, wherein the controller commands the drive-side inverter to generate active vectors only; and wherein null vectors are imposed by the source-side inverter.

11. (canceled)

12. (original): The apparatus of claim 1, wherein the dc current link includes a diode bridge for bi-directional flow.

13. (currently amended): A controller for a first inverter coupled between a power source and a dc current link and a second inverter coupled between an ac drive and the dc link, the controller comprising:

a circuit for commanding the first inverter to perform current regulation on the dc current link during a first portion of each modulating cycle and current mode space vector modulation during a second portion of each modulating cycle, wherein the first inverter is terminated in a capacitor bank and wherein the space vector modulation produces a current Park vector;

the circuit commanding the second inverter to operate in commutation mode, using phase angle of the current Park vector to command switches of the first inverter to connect selected phases of the capacitor bank to the dc current link, and performing damping during each second portion of the modulating cycle through modification of the phase angle by computing a Park vector of capacitor bank voltage, computing a second Park vector representing

resonant frequencies of the voltage Park vector, regulating the second Park vector, and using the regulated second Park vector to correct the phase angle.

14. (original): The controller of claim 13, wherein the circuit varies duty cycle of each first portion to control average current in the dc link.

15-17. (canceled)

18. (original): The controller of claim 13, wherein the circuit performs power factor control of the second inverter such that motor current is in phase with motor back emf.

19. (original): The controller of claim 18, wherein the circuit commands the second inverter to generate active vectors only; and wherein null vectors are imposed by the first inverter.

20. (currently amended): ~~The controller of claim 13,~~A controller for a first inverter coupled between a power source and a dc current link and a second inverter coupled between an ac drive and the dc link, the controller comprising:

a circuit for commanding the first inverter to perform current regulation on the dc current link during a first portion of each modulating cycle and current mode space vector modulation during a second portion of each modulating cycle, the circuit commanding the second inverter to operate in commutation mode,

wherein the controller generates a vector indicating back emf, computes a current Park vector that is synchronous with respect to the back emf Park vector, PI-regulates an imaginary portion of the synchronous current Park vector, and uses the regulated imaginary portion to select switches of the second inverter.

21. (currently amended): Apparatus comprising:

an ac motor;

a first switch-based inverter having an input adapted to receive ac power;

a second switch-based inverter coupled to the ac motor; ~~and~~

means for operating the first inverter in current mode and the second inverter in commutation mode to achieve sinusoidal input currents at an input of the first inverter and sinusoidal output currents at an output of the second inverter; and

position sensors for generating a position signal indicating position of a motor emf Park vector,

wherein the means generates a rotor position unit vector from the position signal, computes a motor current Park vector that is synchronous with respect to the emf Park vector, PI-regulates an imaginary portion of the synchronous motor current Park vector, uses the regulated imaginary portion to shift the position signal into a shifted signal, and uses the shifted signal to select switches of the second inverter.